



TEACHING
CREATIVE AND
CRITICAL THINKING
IN **SCHOOLS**

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**RUSSELL GRIGG
AND
HELEN LEWIS**

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To Jack, Mildred and Dilys



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ABOUT THE AUTHORS

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WHAT CAN WE LEARN FROM THE HISTORY OF THINKING, CHILDHOOD AND SCHOOLING?

INTRODUCTION

In 2016, Paul Dix asked teachers to nominate the greatest educational fads or gimmicks over the last twenty years.¹ The responses included learning styles, Brain Gym and Personal Learning Thinking Skills. The latter was originally introduced in 2005 as part of government reforms of education for 14–19-year-olds (DfES, 2005). The framework set out skills that young people would need to enter the workplace and adult life as confident and capable individuals. These skills included creative thinking (e.g. generating ideas and questioning assumptions) and independent enquiry (e.g. evaluating information, judging its relevance and value). On 15 February 2011, the framework was consigned to the National Archives. It seems appropriate then to take stock and reflect on what we can learn from past efforts to teach thinking. Where did this ‘nice [but impossible] idea’, as the blogger put it, originate?

¹www.teachertoolkit.co.uk/2016/07/10/education-fads/ (accessed 3 November 2017).

In this chapter, we trace the origins and development of thinking in the broader context of ideas about childhood and schooling. This should prove instructive in understanding where the teaching of thinking fitted into the priorities of past educational systems, how these have changed and why, metaphorically speaking, ‘thinking skills’ deserve to be brought out of the National Archives. This chapter also serves another purpose. It illustrates how much of the discourse in education, which forms the backdrop to the teaching of thinking, and ideas around curriculum reform, effective pedagogy and the respective roles of teacher and learner are recurring themes in history. The overview offers an anchor point at a time when those entering the teaching profession have so little input on the history of education in their initial teacher training. The chapter focuses on developments as seen through a Western lens. However, interest in Eastern thinking has increased in recent years following the leading performance of educational systems in countries such as Singapore, Hong Kong and South Korea (see Chapter 3).

THE ANCIENT MIND

A new field of enquiry called cognitive archaeology skilfully pieces together the material remains from the distant past to try and figure out what people thought long ago. Archaeologists (Renfrew, 2007; Coolidge and Wynn, 2009) reckon that the making of the first stone tools required considerable planning (e.g. to collect raw materials some distance away) and imagination, as no one would have known what the finished tools would look like. The stone workers (knappers) had to visually rotate in their minds, images of what would happen to a stone if it were struck in a certain way and then imagine how it would then look from the other side. And this was the kind of intellectual effort needed to make everyday objects. Consider the thinking involved in the building of major cromlechs such as Stonehenge. One study suggests that the Stone Age architects had the geometrical skills to rival Pythagoras – but they lived 2,000 years before the Greek ‘father of numbers’ was born (Keys, 2008). Our prehistoric ancestors were nothing like the cartoon figure, Fred Flintstone.

We also find the origins of creativity in prehistoric times. We can only speculate about what was going on in our ancestors’ minds tens of thousands of years ago when they first picked up natural crayons and began painting their bodies and environment. When cave art in Spain and France was rediscovered in the nineteenth century it was assumed that the art was made for its own sake as prehistoric people were thought too primitive for the higher kinds of reason (Bruno, 2017). More recent interpretations see these earliest creative expressions as records of the histories of tribes, their rituals and beliefs before writing served that purpose. Victor Shamas (2018), an American psychologist, has spent more than thirty years studying what it *feels* like to create something. He believes that since prehistoric times people have always shared the same dual motivation: to produce

something fresh, unlike anything that has gone before; and a spiritual transcendence to connect with something greater, an ideal or hidden truth. Imagine then the determination of prehistoric artists who spent months with little light or oxygen in the dark recesses of caves. They certainly were not motivated by commercial gain. They understood the intrinsic value of being creative, to express feelings, inspire others and connect with the supernatural. The production of stone tools and cave art are only two examples of our longstanding abilities to think creatively and critically. At least in terms of thinking capacity, archaeologists conclude that there is little difference between modern and ancient minds. The creative explosion of prehistoric art has been described as ‘when the final major re-design of the mind took place’ (Mithen, 1996: 174).

THINKING IN THE FIRST SCHOOLS

Our earliest glimpses of the teaching of thinking in formal education can be traced to the ancient Greeks, who created the first educational system more than 2,500 years ago. The unqualified elementary schoolteacher was only responsible for teaching children basic skills. Young children’s moral education was entrusted to a pedagogue or family servant, who escorted the children (boys only) to and from school. Literally and metaphorically, the pedagogue held a lantern to light their path. While the primary teaching focused on reading, writing and counting, largely through recitation and drill, the secondary schools introduced textual criticism, grammar and the natural sciences of mathematics, music and astronomy. There were also gymnasiums for training in sport. Although we can trace here the beginnings of critical thinking being taught, this did not extend to creative thinking. Marrou (1956: 175) pointed out:

‘ The schoolboy of antiquity was not obliged to be original: all that was required of him was that he should learn to write and criticize according to certain rules. ’

In higher education, there was an emphasis on the teaching of philosophy, logical thinking and rhetoric or effective speaking, all highly regarded in society. The itinerant teacher Protagoras (486–411 BC), for instance, once charged 10,000 drachmas for a course on rhetoric at a time when one drachma was a skilled worker’s daily wage (Worthington, 2007). For ambitious young Athenians who wanted a career in politics, learning how to win an argument then was an appealing proposition. The most successful rhetoric contained:

- Logos (Greek for ‘word’) – logical facts and figures, to appear knowledgeable
- Pathos (Greek for ‘suffering’ or ‘experience’) – imagination and feelings, the emotional impact

- Ethos (Greek for 'character') – personal anecdotes, to convince the audience of the speaker's trustworthy character and credibility
- Kairos (Greek for 'right time' or 'opportunity') – maintaining the appropriate tone, structure and timing.

Today, the most acclaimed public speeches are built on similar principles. In a review of the best Technology Entertainment and Design (TED) talks, some of which have attracted millions of viewers, Anderson (2018: 10) identifies the importance of connecting to audiences with personal stories, focusing on one big idea and asking the question: 'Who does this benefit?' As he acknowledges, public speaking is 'an ancient art, wired deeply into our minds'.

The philosopher Plato (427 BC–347 BC) established the first institution of higher education in Western history, known as the Academy. It was originally a garden where intellectuals gathered. In a sense this was the birthplace of thinking 'as a very special kind of psychic activity, very uncomfortable, but also very exciting' (Havelock, 1963, quoted by Gleck, 2012: 37). Fundamental questions were raised about humanity, the ideal society and the purpose of education therein. Plato believed that we come into the world equipped with hard-wired innate ideas (e.g. about love, morality and mathematics), which could be stirred through reflection. Aristotle (384 BC–322 BC), Plato's star pupil, challenged this and argued that the source of learning is experience. As Gaarder (1995: 89) explains in the wonderfully erudite *Sophie's World*, Aristotle 'got down on all fours and studied frogs and fish' whereas Plato was more interested in the eternal world of ideas. Prinz (2012) points out that the entire history of Western philosophy is a set of footnotes on this seminal debate: whether knowledge is acquired through perception (the senses) or thinking (reason). Aristotle maintained that the distinguishing feature of what makes us human is the ability to make rational decisions and his system of logic provided the blueprint for Western education.

Although the ancient Greek world was very different from our own, it remains the key anchor for modern debates over how children should learn. For example, Plato suggested that the education of young children should be play-based because 'nothing that is learned under compulsion stays with the mind' (quoted by Thomas, 2013: 4). And yet, Greek schools were characterised by a didactic, heavy-handed style of teaching and corporal punishment designed to instil memory recall, discipline and obedience. Put crudely, the Greek philosophers put a marker down as to whether schools should instruct children and transmit knowledge or cultivate independent thinking and discovery. The suicide of Socrates in 399 BC raised further questions about the extent to which free speech and thinking should be tolerated. Socrates was accused of corrupting young minds through his continual questioning and probing. He maintained that his philosophical enquiry was a means of answering the big question, 'How should we live?' The scholar Gregory Vlastos (1991), who spent his academic life studying the Greek philosophers, concluded

that the Socratic method was ‘among the greatest achievements of humanity’ because this opened up philosophy to the ‘common man’. The legacy can be found not just in movements such as Philosophers in Pubs² and Philosophy for Children (Chapter 8) but social networking services such as meetup.com, which bring people together to discuss their passions.

However, several modern writers (De Bono, 1994; Finn, 2015) blame the ancient Greeks for undervaluing creative thinking that did not feature strongly in their formal schooling. It is noteworthy that the Greeks had a rich vocabulary for critical thinking – ‘critic’, ‘critical’, ‘criterion’ and ‘criticism’ all stem from their literary judges (*krites*) – but not an equivalent stock of words for creativity.³ Critical thinking certainly offered structure and logic so necessary when processing information in the Greek quest to ‘know thyself’. And yet this has also meant that Western schooling, built on the Classical model, has largely ignored the more expressive, emotional and creative aspects of education. This is despite the pleas of individuals such as the Roman writer Cicero (106 BC–43 BC) for a broad-based education in the liberal arts (*artes liberales*), which at the time was effectively training in how to be a good citizen. Philosopher Martin Nussbaum (2010) believes that this remains essential for democratic societies because it involves fostering critical thinking, problem-solving and an understanding of others.

MEDIEVAL SCHOLASTIC THINKING

Throughout the medieval period and beyond, the grammar school curriculum was modelled on ‘the seven liberal arts’: grammar, rhetoric and dialect (*trivium*) and arithmetic, geometry, music and astronomy (*quadrivium*). The Trivium provided grounding in the rules of language necessary to study any subject. John of Salisbury (c. 1120–1180) argued it was the basis of independent learning because once these were grasped, students did not need the help of a teacher to understand the meaning of books or to find solutions to problems. Robinson (2013) suggests that the Trivium was a *way* of knowing rather than just what was learned: grammar (knowing), rhetoric (communicating) and dialect (questioning). Far from being a medieval relic, Robinson argues that a contemporary trivium would offer much to modern-day students.

Historians have traditionally dismissed education in the Middle Ages as a period of stagnation where ‘practically nothing’ was added in terms of ideas (Curtis and Boulton, 1965: 93). This is not true. The words ‘scholar’ and ‘scholarship’, for instance, come from

²<http://philosophyinpubs.co.uk/> (accessed 20 June 2018).

³However, the Greek root (*krainein*) for the Latin verb *creare* meant to ‘fulfil’ and by this definition, anyone who fulfils his or her potential can be described as creative (Pope, 2005: 60).

the medieval practice of writing critical remarks (*scholia*) in the margins of texts. Scribes also introduced word separation in Classical texts, which had previously been single blocks with very little or no punctuation. While this kind of scholarship was limited to the major libraries and monasteries of the medieval world, there is a little bit of evidence to suggest that a few teachers offered their students momentary respite from the tedious exercises in rote learning and translation that characterised medieval schoolrooms. For example, an eighth-century teacher called Aldhelm enjoyed writing his own riddle books designed to test how 'quick-witted' children were, as well as providing a source of pleasure. He also wrote dialogues in which, unusually, children asked the questions rather than the teacher (Godfrey, 1907: 35–36). At the higher levels of study, in the top fee-paying schools, scholars engaged in disputations that undoubtedly involved applying skills in logical thinking (Orme, 2006).

In the twelfth century, leading schoolmen ('scholastics') combined mainly Greek pagan thinking with Christian teaching to produce 'scholasticism'. This was an approach to critical thinking that featured the forerunners of the lecture (*lectio*) and debate (*disputatio*). The medieval Church, which was inseparable from society, harnessed critical thinking for its own purpose in identifying and refuting (or burning) heretics. Students engaged in theological arguments, led by the likes of Thomas Aquinas (1225–1274) and William of Ockham (c. 1288–c. 1348). Aquinas developed natural theology, in which he used reason and the experience of nature to provide arguments for the existence of God. Ockham introduced the principle that among competing hypotheses, the one with the fewest assumptions should be chosen. 'Ockham's Razor', as it is called, is still referred to in rational thinking as a means of shaving away any material that is superfluous and opting for the simplest explanation.

The aims of schooling the poor in the Middle Ages were to inculcate industrious habits and to remind them of their station in life in a very hierarchical society. This was not the time or audience for teaching critical or creative thinking. But as one expert points out, for the clear majority, 'It was not an unrealistic upbringing for their situation at that time' (Jewell, 1998: 91).

THINKING IN THE RENAISSANCE AND THE ENLIGHTENMENT

In the fifteenth century, a group of intellectuals known as humanists started to question the scholastic, medieval approaches to learning. John Colet (1467–1515), for example, regarded the manner of disputations that aimed simply to win arguments as valueless. He told the Dutch scholar Erasmus (1466–1536): 'We seek not for victory in argument but for truth' (quoted by Curtis and Boulwood, 1965: 117). Erasmus criticised slavish rote

learning, arguing that the gaining of knowledge could only be achieved through purposeful, intelligent thinking. He would undoubtedly be satisfied with the strapline of the modern-day European Commission Erasmus+ projects: 'Enriching lives, opening minds'.

Renaissance scholars worked on the premise that religion, art, human nature, law and other aspects of life were open to criticism. The natural philosopher Sir Francis Bacon's (1561–1626) *The Advancement of Learning* (1605) has been held up as one of the first texts in critical thinking. He believed that truth could be established not by rational argument, as Aristotle maintained, but through real-world investigation (empiricism). Thus, Bacon is credited as being the creator of modern science. He was responsible for moving the study of nature from 'armchair speculation' and abstract reasoning, to experimentation and first-hand observation through the scientific method (Henry, 2017).

The invention of the printing press in the fifteenth century was undoubtedly one of the most significant milestones in the history of literacy, thought and education. It was the engine of creative thinking in art, science and literature. The actual invention and operation of the printing press was a highly creative process by itself. Images originally designed to be placed on walls or parchments now appeared in woodblocks and engravings, reworked by potters, cabinet-makers, glaziers and tapestry weavers. A new generation of artists emerged. Their ideas were circulated and preserved in print, thus elevating them to 'immortal' status. Incidentally, the word 'stereotype' is derived from the printing press, when plates (called stereotypes) were used to produce identical copies of one page. Today, one of the functions of critical thinking is to challenge stereotypes such as people from the same country or race are alike, as if they have all been stamped from one plate.

The story of the printing press is also instructive in highlighting the dangers of creativity, which most people assume is a good thing. If someone is called 'creative' then this is naturally taken as a compliment. In describing the impact of the printing press, Eisenstein (1982: 254) points out that the 'creativity of one generation proved more burdensome to the next'. Playwrights, poets, composers and writers were caught up in an increasingly frantic pursuit of novelty. Critics were quick to judge the quality of printed work and so artists were expected to spend more time researching their subjects, i.e. more time in the library than the workshop to ensure accuracy of fine details, such as whether Saint Jerome wore a red hat as was the fashion among contemporary cardinals. The 'correct' presentation of historical subjects assumed greater importance than imaginative thinking.

The collection of ideas, values and beliefs known as the Enlightenment (c. 1650–1800) placed an emphasis on human rational capacity to advance knowledge and improve social conditions. Before the Enlightenment, Christian intellectuals saw education in terms of transmitting truths necessary for salvation. The essence of the Enlightenment was to suggest that reason, experience and exploration, rather than superstition and belief in received wisdom, were the key to the good life. The author Steven Pinker (2018), in *Enlightenment Now*, points out that the uplifting Enlightenment principles of

applying reason, science and humanism remain highly relevant in an age of cynicism, doubt and fear. The implied purpose of education was to liberate rather than constrain. But, as Phillips (1996) points out, some of the leading figures of the Enlightenment recoiled at the implications of their philosophy because they had no intention of overthrowing the established order. Rather, they wanted to redefine it.

René Descartes (1596–1650), the most famous rationalist, was a very restless spirit, moving house at least eighteen times in twenty-two years. Due to childhood illness, he often slept until noon and valued his bed as ‘the best place to think’ (Zeldin, 1994: 192). Descartes cast doubt on the reliability of learning through the senses because they can deceive. He was right. Consider how optical illusions distort appearances and we know that amputees experience sensations such as itching and pain from missing limbs. Instead, Descartes looked inwards and developed a systematic approach to doubting something until it could be proved. His famous dictum, ‘I think, therefore I am’, was his conclusion that the very act of doubting was a form of thinking and therefore assurance that he was alive. As Zeldin (1994: 192) put it, Descartes made ‘the historic and heretical pronouncement that curiosity was something all people had, that nothing could prevent it, and that it increases inevitably with knowledge’.

The Enlightenment is particularly relevant to our overview because it signalled new thinking over how our mind works, the way childhood was understood and the purpose of education. Richard Mulcaster (1531–1611), a sixteenth-century schoolmaster, believed that educators should seek to enhance children’s natural capacities: ‘whereto nature makes him toward, but that nurture sets him forward’ (quoted by Prinz, 2012: 8). He was the first to use the terms ‘nature’ and ‘nurture’, which became central to the enduring debate about whether intelligent behaviour is determined by biology or the environment, and which has only recently been resolved as a kind of score draw (Ridley, 2003; Dowling, 2007; Kovas et al., 2013; Polderman et al., 2015).

This was a period when elaborate theories of consciousness first developed, which recognised that the mind was not a passive receptor but an active processor of information (Bullard, 2016). The philosopher John Locke (1632–1704) put forward the theory of mental association where an idea is triggered by association with another idea. For example, he suggested children’s fear of the dark was associated with the stories about goblins and spirits they were told at night by ‘foolish maids’ (Locke, 1690: 8). Locke is often associated with the ‘blank slate’ view of the mind, a phrase first coined by Thomas Aquinas. Locke actually said that children were like ‘white Paper, or Wax, to be moulded and fashioned as one pleases’ and that ‘nine parts of ten are formed by upbringing or education’ (Locke, 1690: 217), but he added that ‘due weight should be given to the tenth part’. In other words, learning was largely a matter of nurture but not exclusively so. Locke’s most famous work, *Some Thoughts Concerning Education* (1693), became the most influential book about thinking in Western history for the next 200 years. Locke gave all kinds of

weird and wonderful child-rearing guidance, for example on sleeping, diet and footwear, but the key point was that he recognised the need to strengthen children's powers of reasoning through experience. He likened children to newly arrived travellers to a strange country who had to learn the customs and ways of life. Locke hinted at the plasticity of children's thinking: 'I imagine the minds of children as easily turned this or that way as water itself' (quoted by Thomas, 2013: 20). Locke did not, however, say much about the importance of feelings and he regarded imaginative thinking as 'a source of mischief' (Quick, 1907: 222). His focus was on the education of the young gentleman fit for seventeenth-century society.

A more romantic notion of childhood can be traced to the Swiss philosopher Jean-Jacques Rousseau (1712–1778). He believed that children were not born in sin, as the Church taught, but innocent and naturally good. It was the corrupting influence of adults that children needed to be protected against. His most famous work, *Emile* (1762), based on the development of a fictitious pupil in the care of his tutor, sets out how children should be educated and its purpose, namely to achieve happiness. Children should learn through trial-and-error, observation, play and exploration. They should enjoy the 'Age of Nature' (0–12 years) to run around free from constraints, including reading books,⁴ and acquire knowledge through first-hand experience.

Rousseau's enlightened view of childhood didn't prevent him from allowing his own illegitimate children to be sent to an orphanage. However, his writings influenced succeeding generations of progressive thinkers, including Johann Pestalozzi, Robert Owen, Friedrich Fröebel, Rudolf Steiner and Loris Malaguzzi. Over time, the respective state policies towards education, particularly in the early years, have been shaped by their child-centred views. However, the short-term impact of a handful of European thinkers on mainstream education should not be overstated. Before the nineteenth century, most children were not even attending school. Those who were in classrooms received little encouragement to express their views, think independently or follow their interests. Things continued very much as they had always done, characterised by rote learning, the teaching of Scripture and basic skills in reading, writing and arithmetic.

CHALLENGING THE INDUSTRIAL MODEL OF EDUCATION

The industrial revolution heightened political interest in providing mass education to ensure that Britain had the necessary basic skills to remain economically advanced. From

⁴The exception was *Robinson Crusoe*. Ironically, children's books were invented during the Enlightenment.

the 1830s, gradually a dual system of Church and state-funded elementary schools operated very much on a factory model of 'producing' an obedient, literate and God-fearing workforce. A few voices, such as the Scottish philosopher Thomas Carlyle (1795–1881), saw the potential of education 'to impart the gift of thinking to those who cannot think' (quoted by Williams, 1958: 82). Radical reformers such as the Chartist William Lovett (1800–1877) envisaged 'Schools for the People' in which children and adults had access to 'useful works on politics, morals, the sciences, history and such instructing and entertaining works as may be generally approved of' (Kelly, 1970: 141). For most in authority, however, this was not the time to expand minds – as one school inspector lamented, he had never heard a child 'ask a question of its teacher on the subject of the lesson' (Martin, 1979: 51).

There were exceptions. Richard Dawes (1793–1867) opened an excellent school at King's Somborne, Dorset in 1842. He was the local rector, a keen scientist and eager to train children in how to observe and think logically. Hence his pupils calculated wind speeds from cloud shadows, worked out water pressure on fish in streams and compared animals' teeth. He set up a library so children could take books home to read to their parents. The children formed clubs to carry out their investigations. No doubt they were engaged in much reasoning, inferring and other higher-order thinking skills. Dawes regarded the conventional schools as 'a deception, retarding the cause of education rather than advancing it' (quoted in Stewart and McCann, 1967: 133). And yet the Victorian education policy-makers and teachers largely achieved their objectives. Basic literacy levels increased from approximately 73 per cent (female) and 80 per cent (male) to 97 per cent for both men and women (Lawson and Silver, 1973). The system of schooling contributed to preserving the social order and most young people had respect for their elders.

Historians trace more 'progressive' tendencies in the curriculum and pedagogy to a series of official publications, the *Handbook of Suggestions for the Consideration of Teachers* (1905–1957). The remarkable Robert Morant, Permanent Secretary to the Board of Education, introduced these handbooks. He has been described as 'an educational buccaneer, a desk-bound Francis Drake' (Eaglesham, 1967: 39). Primary teachers responded to suggestions from both the Board of Education and Her Majesty's Inspectors of School that children should be taught in creative ways and learn through first-hand experiences such as visits to local parks and museums. For the first time in their lives, such visits allowed thousands of London children to see the River Thames while others were amazed at the sight of a cow in the flesh. Teachers had scope to provide 'realistic studies' by making lessons relevant. For instance, rather than write an imaginary letter to a child in France, children corresponded with French pen pals. Technologies were also embraced by a growing number of schools. By the 1930s, around 800 schools were reported to be using projectors to show films and about 5,000 made some use of the wireless (Lowndes, 1937: 172). In practical subjects, such as woodwork and metalwork, the emphasis was placed on

giving children simple tools and materials to work independently as soon as possible. In drama, children were taught creative skills such as puppetry.

Official encouragement for schools to provide a richer curriculum and to develop children's thinking capabilities was further endorsed in the Hadow Report of 1931: 'the development of [children's] critical powers should be encouraged, so that, as time goes on, the child should be taught to rely more upon his independent initiative and enterprise' (Board of Education, 1931: 43). The Hadow Committee discussed how primary schools could promote children's 'higher mental capacities' in real-life contexts. It was scornful of teachers who concentrated merely on instruction in reading, writing and arithmetic without giving 'meaning' to these skills by relating them to children's 'living interests'. The Hadow Report signalled a progressive turn in the very notion of what schools were for: 'a good school is ... not a place of compulsory instruction, but a community of old and young, engaged in learning by cooperative experiment' (1931: Introduction), while 'the curriculum is to be thought of in terms of activity and experience rather than of knowledge to be acquired and facts to be stored' (1931: section 75).

Members of the Hadow Committee drew upon the sentiments of John Dewey (1859–1952) and Maria Montessori (1870–1952). Dewey argued that schools were more interested in meeting curriculum demands ('covering the ground' as he put it) and transmitting knowledge rather than nurturing the mind. In *How We Think* (Dewey, 1910), Dewey explained that education was not about learning facts but developing criticality and reflective thinking. This was best achieved through practical problem-solving, an approach generally termed instrumentalism, which remains hugely influential in primary education today. Montessori looked upon the infant school as an idealised home with exemplary family role models. These views stood in contrast to the traditional factory model of education with its emphasis on efficiency, repetitious teaching methods and little scope for children's creative thinking.

The spirit of educational reform and reconstruction that followed the Second World War, embodied in the 1944 Education Act, offered new freedom and opportunity for all. A primary sector from 5 to 11 years was established with progression to secondary education. The 'elementary' tradition, which saw schools concentrate on teaching 'the basics' within a strong religious framework, now competed with a 'developmental' (child-centred) view of education and the arrival in middle schools of a secondary (subject-centred) view (Blyth, 1965). The rise of developmental psychology over the next twenty or so years pointed in a new direction where primary schools were not just seen as places of instruction but centres of child life in general.

These sentiments gathered pace during the largely optimistic and confident spirit of the 1960s. The landmark Plowden Report made it clear that 'at the heart of the educational process lies the child' (DES, 1967: 7). Based on visits to schools, members of the Plowden Committee concluded that formal lessons tended to replace more creative approaches in

the junior years. They were critical of problem-solving tasks that were ‘simply mechanical sums in disguise’ – for example, ‘calculating how many men would take how many hours to dig so many yards of ditch if it took another lot of men a different number of hours to dig a different length of ditch’ (DES, 1967: 237). These did little to develop constructive thinking. Instead, the Plowden Report recommended authentic problem-solving using the school and local environment, such as how much water is being wasted in 24 hours, a week or a year, when a tap is left dripping in a cloakroom. It was critical of the teaching of punctuation and grammar because they hindered creativity. There are commentators who identify the problems of modern-day education to such thinking (Phillips, 1996; Peal, 2014).

Despite an immediate backlash to Plowden’s child-centred philosophy (Bantock, 1969), the government endorsed the importance of teaching children to think critically and creatively, stating that the primary school should ‘help children develop lively, enquiring minds; giving them the ability to question and to argue rationally, and to apply themselves to tasks’ (DES, 1977: 6). However, it was also acknowledged that some less able and experienced teachers had fallen into a ‘trap’ by applying freer methods uncritically and at the neglect of teaching basic skills. Ironically then, teachers’ own critical thinking skills were called into question. Too many did not monitor pupils’ development of skills in English and mathematics closely enough. While most children acquired these reasonably well, those who did not floundered (Bassey, 2012). By the 1980s, only 10 per cent of schools were doing ‘learning by discovery’ as advocated by Plowden, the same as in 1967 (Galton, 1995). Ricard Mayer (2004), an American cognitive psychologist, suggests that in each decade since the mid-1950s, despite solid evidence questioning the effectiveness of discovery learning, a similar approach pops up under a different name (problem-based learning, inquiry learning, experiential learning, constructivist learning) and the cycle repeats itself.

The Plowden Report was influenced heavily by the work of the Swiss psychologist Jean Piaget (1896–1980). His cognitive theory suggested that the child actively interprets the world and constructs knowledge (as opposed to receiving it). Using his own children as subjects, he observed that children think differently from adults. They consistently gave wrong answers to certain types of problems. For instance, if the water from a tall jar was poured into a shorter, fatter one, young children would say that the taller jar contained more water. Plowden took on board Piaget’s theory uncritically and agreed that children should learn at their own pace through distinct stages of learning. It is not necessary to rehearse these here, nor the criticisms that have been capably covered elsewhere (Mooney, 2013; Gray and MacBlain, 2015). However, it is worth noting that Piaget’s central idea about children constructing their own mental worlds dominated teacher training over the second half of the twentieth century.

Lev Vygotsky (1896–1934) and Jerome Bruner (1915–2016), most closely associated with social constructivist theories of learning, addressed several shortcomings in Piaget’s

work. They highlighted, for example, a more prominent role for language and the skilful contribution of more knowledgeable others (e.g. adults or older peers) to the development of children's learning and thinking. They did not accept the concept of 'readiness', arguing for a less rigid view of children's intellectual development. In short, they paved the way for current views on the fluid, multiple nature of intelligence (Gardner, 2000) and the importance of high-quality talk in the classroom (Alexander, 2008).

The importance of culture and the environment in shaping how children think was illustrated by the pioneering work of Reuven Feuerstein (1921–2014). He fled Romania for Palestine during the Nazi persecution and taught child survivors of the Holocaust, which spurred his interest in meeting the needs of refugee children. The improvements in learning they made following interventions led Feuerstein to conclude that intelligence was not fixed or limited by genetic inheritance. Some culturally deprived children regarded as unteachable made good progress, illustrating the potential for growth. Feuerstein's ideas were expressed decades before neuroscientists' groundbreaking findings on brain plasticity. He developed mediated learning programmes that supported *all* children's higher-order thinking, including those with learning disabilities. Feuerstein believed that children's intelligence could be modified and should not be predefined by stages. Here he differed from Piaget, one of his teachers at the University of Geneva. For instance, Piaget claimed that young children could not solve analogy problems before the stage of formal operations. However, Feuerstein showed through his experiments that this was not so, provided they were presented with stimuli in a systematic way and were helped to organise information (Feuerstein et al., 2015).

MODERN TIMES

The last quarter of the twentieth century was a time when education was increasingly subjected to centralisation, privatisation, parental choice, greater teacher accountability and a focus on performativity (forces collectively described as 'neoliberalism'). A subject-based National Curriculum was introduced and, although later slimmed down, left teachers increasingly in the role of curriculum deliverers rather than innovators. Despite the political rhetoric of modernisation and 'a third way' (between the old left and the Conservative right), New Labour elected in 1997 continued many of the policies developed by the previous Conservative government. Although non-statutory, the introduction of national literacy and numeracy strategies in 1998 and 1999, along with literacy and later numeracy hours, effectively meant that teachers were increasingly being told not only what to teach but *how* and *when*.

Interest in thinking skills developed in the late 1980s and 1990s as part of broader discussions around improving standards. Philip Adey and Michael Shayer led a research team from King's College, London. They developed classroom materials for the teaching

of science called *Cognitive Acceleration Through Science Education* (Shayer, 1988), discussed further in Chapter 8. The authors shared Feuerstein's premise that any pupil could make good progress if taught in the right way. They developed a similar approach in mathematics and English through *Let's Think* materials (Chapter 6), with statistically significant learning gains reported (Adey and Shayer, 1994; Shayer and Adhmi, 2007). Elsewhere, a Thinking Skills Research Centre was established at Newcastle University with academics sponsored by various bodies to investigate the impact of thinking skills lessons (Hall et al., 2005). In 1998 Professor Carol McGuinness was commissioned by the Department for Education and Employment to undertake a literature review and evaluation of the most successful approaches (McGuinness, 1999). Consequently, thinking skills became one of six key skills to be embedded across the national curriculum in England. They were badged as universal skills helping pupils to focus on 'knowing how' as well as 'knowing what' – learning how to learn.

The role of schools in promoting creativity also attracted growing interest. A report on the arts in school (National Advisory Committee on Creative and Cultural Education, 1999) attempted to reinvigorate the arts curriculum, while the Creative Partnerships initiative (2002–2011) linked schools to artists, architects, scientists and other creative thinkers, albeit with mixed results (Ofsted, 2006; Bragg and Manchester, 2011). The introduction of the government strategy *Excellence and Enjoyment* (DfES, 2004) encouraged teachers to take a creative approach to the curriculum and provided a bank of professional development resources to this end. However, critics claimed that New Labour's policies on personalised learning indicated a return to child-centred ideology – 'Plowden with tests'.

It proved difficult to retain a focus on creativity and enjoyment within what was effectively a two-tiered curriculum, along with league tables, testing and a competitive market. Even within the core subjects of English, mathematics and science, concerns were raised over narrow, teaching-to-the-tests pedagogy. Paul Andrews (2004), chair of the Association of Teachers of Mathematics Council, pointed out (largely in vain) that 'children must be helped to see maths as a creative, imaginative and problem-solving set of challenges'.

The election of the Coalition and then Conservative governments in 2010 and 2015, signalled a decline in official support for thinking skills in England. When the revised curriculum was introduced the stance taken by Michael Gove, then education minister, was that knowledge precedes thinking and what matters most is ensuring that children develop a solid base of core knowledge to build upon (Gove, 2013). A hundred leading university academics published an open letter in the media complaining about a return to rote learning and 'an endless list of spelling, facts and rules' (*The Independent*, 19 March 2013). These academics wanted the government to give teachers greater professional autonomy in making decisions about the curriculum. Their support for the central value of creativity in the curriculum echoed the views of teachers and others in the Cambridge Primary Review (2006–2009), the largest review of primary education since Plowden. Witnesses were united in complaining about the loss of 'creative' teaching and

opportunities for children to be creative, over the past twenty years. They expressed concern over the dominant conception of childhood as a time of preparation for adulthood, which had stifled creativity, enjoyment and imagination (Alexander, 2010). Unfortunately, the comparatively high level of curriculum prescription in England and a narrow focus on attainment in a few subjects has had a negative impact on creativity in primary and secondary schools (Warwick Commission, 2015). One primary head goes so far as to suggest that 'We now create clones, not individual children with unique ideas and the ability to think outside the box' (Harris, 2016).

This is not the case, however, in the policy rhetoric surrounding the education of young children (0–5 years in England). The Tickell Review (2011) highlighted playing and exploring, active learning, and *creating and thinking critically*, as the three characteristics of effective learning. Despite fears that government plans for more formal learning and assessment reforms (the 'nappy' curriculum) would undermine the role of play in the early years (Paton, 2012), the principles outlined by Tickell remain in place in the latest statutory framework for the education of young children (DfE, 2017) in England, while there are similar endorsements for play-based learning in Wales, Scotland and Northern Ireland.

Nonetheless for older primary and secondary school children, the official policy steer in England shaped by testing regimes and the sanctity of data has veered away from the rest of the UK. In Wales, the new curriculum is designed, among other purposes, to develop learners who are enterprising and creative contributors to society. In Northern Ireland, one of the principles underpinning the curriculum is encouraging creativity and providing opportunities for children to engage in exploration, problem-solving and decision-making. In Scotland's Curriculum for Excellence, creativity has a high profile with an emphasis on providing young people with the skills to manage life's uncertainties and rapid changes. In contrast, the national curriculum in England is couched in knowledge-centred terms with references to the teaching of creativity and critical thinking buried deep within specific subjects, reflecting the view that thinking skills can only be taught within a subject context. Hence teachers are expected to demonstrate the skills and processes essential to writing, such as thinking aloud, in the collection and redrafting of ideas.

The thinking skills adopted throughout the UK are broadly similar although there were a few anomalies illustrating the difficulties in defining their nature and scope. Take problem-solving skills as an example. In England, problem-solving features as a separate key skill *outside* thinking skills whereas in Wales it is linked to critical thinking, in Northern Ireland it is associated with decision-making, while in Scotland it is not listed. In Wales, thinking skills were originally introduced as part of a non-statutory *Skills Framework for 3–19 Year Olds* and tied closely to an Assessment for Learning agenda (Stewart, 2014). The most recent curriculum review (Donaldson, 2015) suggests thinking skills form part of a statutory set of wider skills across the curriculum.

Table 2.1 Thinking skills across UK curricula, 1999–2015

Country	Framework	Thinking Skills
England	Among the Key Skills in the National Curriculum	<p>Before 2013</p> <ul style="list-style-type: none"> • Information-processing • Reasoning • Enquiry • Creative thinking • Evaluation <p>After 2013 No explicit reference but thinking skills integrated in subjects</p>
Northern Ireland	Part of the Thinking Skills and Personal Capabilities Framework	<ul style="list-style-type: none"> • Managing information • Problem-solving and decision-making • Being creative • Working with others • Self-management
Wales	Wider skills within Donaldson Review	<ul style="list-style-type: none"> • Critical thinking and problem-solving • Planning and organising • Creativity and innovation • Personal effectiveness
Scotland	Skills for Learning, Life and Work within the Curriculum for Excellence	<ul style="list-style-type: none"> • Remembering • Understanding • Applying • Analysing • Evaluating • Creating

This chapter has put into historical context the development of the teaching of thinking in schools and society. The overriding question – what is the purpose of education? – has been batted around from one generation to the next. It seems like every twenty-five to thirty or so years there is a crisis of confidence in what education is for. Thomas (2013) suggests it all comes down to two basic positions: either schools exist to transmit facts and established ideas, the best of our cultural heritage, or they aim to foster independent thinking, questioning, discovery and self-awareness. While common sense suggests that they should do both, this is much more difficult to do in practice when schools are subjected to high-stakes external accountability and political pressures where only what is measurable seems to be valued. Some sociologists (e.g. Hargreaves, 1994) have argued that schools have not changed much (or enough) in their history when compared to other institutions, such as hospitals. Schools retain outmoded practices (e.g. holidays built around the farming year) and, to put it bluntly, resemble little more than examination factories. This begs the question: is it more important for primary schools to teach easily

assessable basic knowledge and skills and prepare children for secondary schooling, or should education be less instrumental and focus on nurturing the potential of each child? More broadly, is education about meeting the needs of society and the economy, or about developing wider creative and intellectual capacities? These questions are considered in the next chapter where we discuss why the teaching of thinking skills is so important.

SUMMARY

- 🗨 The Greek legacy of critical thinking has shaped much of our educational system, although some writers suggest that this has been at the expense of creativity.
- 🗨 The Enlightenment signalled new thinking on childhood with its emphasis on children's freedom to discover and create for themselves. The implied purpose of education was to liberate rather than constrain young minds.
- 🗨 The priorities of mass education, which followed industrialisation, were to meet the needs of the economy by producing literate, numerate and socially adept citizens. Generally, there was little desire or scope for the teaching of critical or creative thinking to the working classes.
- 🗨 The influence of developmental psychology and progressive thinkers meant that periodically in the twentieth century (e.g. 1930s and 1960s) play, imagination and creative thinking had a strong presence in primary schools.
- 🗨 Particularly in recent years, in England a premium has been placed on a knowledge-rich curriculum. This contrasts with more explicit support for thinking skills elsewhere in the UK.

